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Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO VULCANIZING

PART III WITH OPEN STEAM

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO VULCANIZING

PART III WITH OPEN STEAM

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Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO VULCANIZING

PART III WITH OPEN STEAM

0. FOREWORD

0.1 This Indian Standard (Part III) was adopted by the Indian Standards Institution on 7 November 1968, after the draft finalized by the Chemical Methods of Tests Sectional Committee had been approved by the Textile Division Council.

0.2 This standard is mainly based on the Draft ISO Recommendation No. 1222 Tests for colour fastness of textiles (fifth series):Part 1 colour fastness to vulcanizing: open steam [Doc: ISO/TC 38 (Secretariat-299) 448 E].

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1. SCOPE

1.1 This standard (Part III) prescribes a method for determination of colour fastness of textiles of all kinds and in all forms to the action of a typical rubber compound, such as may be used in the proofing industry and its decomposition products during vulcanization in open steam either:

a) under conditions that prevent live steam coming in contact with the textiles to be tested, or

b) under conditions that allow live steam to infiltrate into textiles to be tested.

2. PRINCIPLE

2.1 A specimen of the textile is heated in a live steam in direct contact with an unvulcanized rubber compound. The textile material should be either:

a) wrapped in impermeable sheeting to steam or water, so that the live steam or water is prevented from infiltrating into the specimen;

or

b) wrapped in undyed bleached cotton cloth, so that the live steam is not prevented from infiltrating into the specimen.

2.2 The change in colour of the specimen and the staining of the cloth are assessed with standard grey scales.

3. SAMPLING

3.1 Lot — The quantity of fibre, yarn or fabric dyed under essentially similar conditions shall constitute a lot. If the lot contains more than 200 kg of fibre or yarn or more than 500 pieces of fabric, it shall be divided into sub-lots of 200 kg or less of fibre or yarn or 500 pieces or less of fabric.

3.1.1 Each sub-lot shall be tested separately.

3.2 Sampling for Fibre and Yarn — From the sub-lot 15 increments from different parts shall be taken and mixed thoroughly. The increments, thus mixed, shall constitute the test sample. The weight of the increment shall be such that three test pieces can be prepared from the test sample.

3.3 Sampling for Fabrics — From the sub-lot, three pieces of fabric shall be selected at random. The pieces, thus selected, shall constitute the test sample.

4. PREPARATION OF COMPOSITE SPECIMEN

4.1 Undyed Cloths

4.1.1 Undyed cloth of the same generic kind of fibre as that in the textile to be tested or that predominating in the case of blends.

4.1.2 Undyed bleached cotton cloth.

4.1.3 A sheet impermeable to steam and water.

NOTE — A rubber proofed fabric or plastic sheet capable of withstanding a temperature of 140°C, such as polyester.

4.2 Remove in polyethylene film from the sheet of uncured rubber compound and moisten it with petroleum spirit.

4.3 If the textile to be tested is fabric, from the sample cut a piece of 10 × 4 cm and place it on the sheet of uncured rubber compound. To ensure an uniform degree of adhension, roll the specimen on the rubber compound with a metal roller.

4.4 If the textile to be tested is yarn, take sufficient amount of yarn and knit it into a fabric. Cut a piece of 10 × 4 cm or stick a number of parallel lengths of yarn flat on the rubber sheet to obtain the specified area of 10 × 4 cm.

4.5 If the textile is loose fibre, comb and compress enough of sample to form a sheet of 10 × 4 cm and stick it to the rubber compound.

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TO
IS : 4635 (Part 3) - 1968 METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO VULCANIZING

PART 3 WITH OPEN STEAM

(*Clause* **2.2**, *line* 1) — Substitute 'adjacent fabric' *for* 'cloth'.

(*Clauses* **4.1**, **4.1.1**, **7.2**, **7.3**, **7.6** *and* **8.1**) — Substitute 'adjacent fabric' *for* 'undyed cloth' or the words 'undyed material'.

(*Clause* **5.2**, *line* 2) Substitute '1·5 ± 0·5 mm' *for* '2·5 ± 0·5 mm'.

(*Clause* **7.4**) — Substitute the following for the existing clause:

'**7.4** Place the tube in the preheated autoclave ensuring that the temperature of the jacket is at 142 ± 1°C (350 kPa steam pressure). Carry out the test for 20 minutes.'

(*Clause* **7.5**) — Substitute the following for the existing clause :

'**7.5** Remove the wrapping cloth and adjacent fabric and condition for 4 hours in the standard atmosphere for testing.'

(*Clause* **7.6**, *line* 2) — Substitute 'IS : 768 - 1982*' *for* 'IS : 788 - 1956*'.

(*Clause* **7.6**, *line* 4) — Substitute 'IS : 769 - 1982†' *for* 'IS : 769 - 1956†'.

(*Clause* **7.6**) — Insert the following NOTE under the clause:

'NOTE — In cases of doubt in the colour fastness ratings as assessed by an observer, the assessment should be done by at least three observers and the overall average rating should be reported.'

(*Page* 6, *foot-notes*) — Substitute the following for the existing foot-notes :

'*Method for evaluating change in colour (*first revision*).

†Method for evaluating staining (*first revision*).'

(TDC 5)

5. APPARATUS

5.1 Jacketed Autoclave — capable of holding steam pressure on both jackect and pan of 4 kg/cm^2.

5.2 Stainless Steel Open-Ended Tube — of diameter 40 ± 3 mm and wall thickness 2·5 ± 0·5 mm.

6. REAGENTS

6.1 Unless specified otherwise, pure chemicals shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

A sheet of rubber compound 2·5 ± 1·5 mm thick consisting of:

a) 100 parts pale crepe,
b) 5 parts zinc oxide,
c) 1 part stearic acid,
d) 2 parts sulphur,
e) 1 part mercaptobenzothiazole,
f) 0·2 part zinc diethyldithiocarbamate,
g) 15 parts titanium dioxide, and
h) 75 parts barium sulphate.

NOTE — If it is necessary to transport the rubber compound, it should be covered with a thin polyethylene film.

7. PROCEDURE

7.1 Wrap the composite specimen around stainless steel tube with rubber face inside.

7.2 To Prevent Ingress of Steam — Cover the composite specimen by tightly wrapping with one layer of undyed cloth (*see* **4.1.1**), three layers of undyed bleached cotton cloth (*see* **4.1.2**) and two layers of impermeable sheeting (*see* **4.1.3**) taking care that the wrapping projects beyond both the edges of the composite specimen on the tube. Securely bind the edges with strings to prevent ingress of steam.

7.3 To Permit Ingress of Steam — Cover the composite specimen by tightly wrapping with one layer of undyed cloth (*see* **4.1.1**) and two layers of undyed bleached cotton cloth (*see* **4.1.2**).

7.4 Place the tube in the preheated autoclave ensuring that the temperature of the jacket is at 141° ± 1°C (2·8 kgf/cm^2 excess pressure) and the pan at 138° ± 1°C (2·5 kgf/cm^2 excess pressure). Carry out the test for 20 minutes.

7.5 Remove the tube and cool in air. Remove the wrapping clothes and separate the test piece from the rubber.

7.6 Evaluate the change in colour of the test piece on the side not in contact with the rubber by the method prescribed in IS:768-1956* and the staining of the undyed cloth on the side in direct contact with the test piece by the method prescribed in IS:769-1956†.

7.7 Repeat the procedure with the remaining test pieces.

8. REPORT

8.1 Report individually the numerical ratings for the change in colour and the staining of the undyed material.

8.2 Report also the method of wrapping followed (*see* **7.2** or **7.3**).

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*Method for evaluating change in colour.
†Method for evaluating staining.

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